SPANISH NEEDLE ONION
Allium shevockii McNeal

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Management Status: Federal: BLM Sensitive
California: S1.3, G1 (CDFG, 1998)
CNPS: List 1B, R-E-D code 3-1-3(Skinner and Pavlik, 1994)

General Distribution:

Spanish Needle Onion is known from only two populations, both in Kern County, on or near the crest of the southern Sierra Nevada Mountains. The larger population, several thousand individuals, occurs on Spanish Needle Peak, which is approximately three-fourths of a mile south of the Tulare County line. The plants occur in seven small canyons just below the summit on the west and northwest faces of the peak, and in two canyons on the east face (McNeal, 1987). The only other known population, 40-50 individuals, occurs in the Horse Canyon area, approximately 12 miles northeast of Tehachapi, at the extreme southern end of the Sierra Nevada range. Before discovery of the Tehachapi population, it was estimated that only 10% of possible habitat had been surveyed for this species (McNeal, 1987).

Distribution Within the West Mojave Planning Area:

The Spanish Needle Peak population appears to straddle the WMPA boundary. Due to the imprecise plotting of the boundary line on available maps, it is not possible to give an accurate estimate of what percentage of the population is within the boundary. The Tehachapi population is a short distance outside the WMPA boundary.

Natural History:

Spanish Needle onion is a perennial herb, 6-8 in. (15-21 cm) tall, that grows from a bulb. It has showy flowers, with tepals that are white to light green below and maroon on the reflexed and curled distal half. There is a single terete leaf.

McNeal places Spanish Needle onion in the *Allium sanbornii* alliance. It shows some similarities to Great Basin onion (*Allium atrorubens),* fringed onion *(A. fimbriatum)* and mountain onion (*A. monticola)*, but is distinguishable from each of these species. Most notable among its differences are: "...1) obovate to oblanceolate outer perianth segments, the outer series of which are strongly reflexed to coiled in the distal half; 2) the light-lemon yellow fresh bulb coats; 3) long filamentous secondary rhizomes that develop from the main bulb, or more commonly from basal bulblets that form on short, stout primary rhizomes at the base of the main bulb" (McNeal, 1987, p. 153).

Allium shevockii reproduces primarily vegetatively, at least in the Spanish Needle Peak population, where McNeal (1987) reported that few mature flowers with developing capsules had been observed. However, Hare (pers. comm., 1997) reported that the Horse Canyon population produces capsules with seeds.

At the type locality, on the west and northwest faces of Spanish Needle Peak, this species occurs in open, predominantly conifer forest, with occasional Jeffrey pine (*Pinus jeffreyi*), sugar pine (*Pinus lambertiana*), pinyon pine (*Pinus monophylla*), canyon live oak (*Quercus chrysolepis*), western juniper (*Juniperus occidentalis*), and limestone mountain mahogany (*Cercocarpus intricatus*) (McNeal, 1987). Understory species in the immediate vicinity of the *Allium* populations are sparse because the slope is so steep and unstable (McNeal, 1987), but herb and subshrub associates include Needles buckwheat (*Eriogonum breedlovei* var. *shevockii*), naked-stemmed buckwheat (*E. nudum*), sulfur-flowered buckwheat (*E. umbellatum*), Wrights buckwheat (*E. wrightii* ssp. *subscaposum*) Davidson's rock cress (*'Arabis davidsonii),* elegant rock cress (*A. sparsiflora* var. *arcuata*), Fort Tejon woolly daisy (*Eriophyllum ambiguum* var. *paleaceum*), golden yarrow (*E. confertiflorum*), prickly phlox (*Leptodactylon pungens* var. *pulchriflorum*), California fuchsia (*Epilobium canum* ssp. *latifolium*), chocolate drops (*Caulanthus pilosus*), gaping bush-penstemon (*Keckiella breviflora*), monkeyflower (*Mimulus* sp.), bird's-foot fern (*Pellaea mucronata*), desert beeplant (*Scrophularia desertorum*) and Parish's snowberry (*Symphoricarpos parishii*) (McNeal, 1987). Shevock and Ertter (1987a) also report Nine Mile Canyon phacelia (*Phacelia novenmillensis*) and large-fruited blue-eyed mary *(Collinsia callosa)* as associates on the west face.

On the east face of Spanish Needle Peak, Shevock reports occasional jeffrey, sugar, and pinyon pines as well as canyon live oak (Shevock et al., 1986b), indicating a very similar community to that on the west slope, but it remains extremely rocky and steep, and is less forested (Shevock, pers. comm., 1999). Other reported associates on this slope (Shevock et al., 1986a) include limestone mountain mahogany *(Cercocarpus intricatus)*, bush rock-spiraea *(Holodiscus dumosa*), beavertail cactus (*Opuntia basilaris)*, spreading phlox *(Phlox diffusa)* and limestone dudleya *(Dudleya calcicola*).

Slopes on the northwest face are moderately (20-45) to extremely (45) steep, and the plants are found at elevations from 5800-7500 ft. (1768 - 2287 m; Shevock, 1985a). In 1987, additional plants were discovered on the west face, extending the population at the type locality down the canyon to 5800 ft. (1768 m) elevation (Shevock and Ertter, 1987b). Because they occur continuously down the same canyon, the west face and northwest face occurrences are treated here as one site. McNeal stated that there were "several thousand" individuals total at the Spanish Needle Peak localities (McNeal, 1987, p.153).

On the east face, the CNDDB report describes the slopes as steep (CDFG 1986) but no quantitative measurements are given. No information about the steepness of the slope is given on the field survey form accompanying the report (Shevock et al., 1986b), so it is unclear where the CNDDB got this information. Less than 500 individuals occur on the east face of Spanish Needle Peak (Shevock et al, 1986b), at an elevation of 6600-7550 ft. (2012-2302 m). (There is a discrepancy between the elevations given in the CNDDB report and on the label of the specimen collected at this site. The report stated the elevation as 6600 ft., but the label indicates 7550 ft. Also, the CNDDB report states there are over 500 individuals present, but the Field Survey Form indicates there are less than 500.)

At Horse Canyon, the plants are reported (Hare, 1996) to occur in four small groups, at least two of which are on a rocky, east-facing slope at an elevation of ca. 4800

ft. (1463 m). Hare (pers. comm., 1997) reports that the plants occur in a narrow elevational range of approximately 50 feet, but the elevation indicated on the label of the specimen from this locality is 5100 ft. (1555 m) (Shevock #13254, CAS; B. Bartholomew, pers. comm., 1997) These inconsistent reports need to be clarified. Surrounding vegetation is sparse pinyon, juniper, and scrub oak woodland, on volcanic tuffs and agglomerates (Hare, 1996). Two groups of plants occur in a small wildflower field/meadow adjacent to ephemeral creeks on private land. The other two groups occur on a dry, stony, open slope on public land. The onion was collected in this area "on a grassy, rocky volcanic slope, with *Dudleya*.." (Shevock and Hare, 1996) Other associates of the Horse Canyon population include Palmer's mariposa lily (*Calochortus palmeri*), pale yellow layia (*Layia heterotricha*,) and Hansen's larkspur (*Delphinium hansenii*; Hare, 1996). Additional species in the same area include other mariposa lilies (*Calochortus* spp.),other species of onion (*Allium* spp.), phlox (*Phlox* sp.), Wright's buckwheat (*Eriogonum wrightii*), death camas (*Zigadenus* sp.), and needlegrass (*Stipa* sp.; Hare, pers. comm., 1997).

Currently, ten years after the plant was first described, there is still no information about seed production or dispersal, germination requirements and/or times, nor any information about pollination ecology, population ecology, mineral requirements, unusual tolerances, or genetics. There is, however, a small population of Spanish Needle onion growing in cultivation at East Bay Regional Parks Botanic Garden, Tilden Park, San Francisco. A few bulbs were taken to the Arboretum in 1987 (B. Ertter, pers. comm., 1997), and are reported to be doing well there, growing in well-drained, rocky soil in full sun. They have been blooming every year, and the number of individuals is slowly increasing (S. Edwards, pers. comm. 1997). Dr. Ertter at that time also gave a few bulbs to the botanic garden at the University of California in Berkeley, but it is her understanding that these bulbs died (Ertter, pers. comm. 1999).

Habitat Requirements:

Spanish Needle onion is a plant of high-elevation, rocky habitats. On Spanish Needle Peak, it occurs in soil pockets in dark-colored metamorphic outcrops and on steep talus slopes at 7216-7708 ft. (2200-2350 m). The bulbs mainly occur along margins of the outcrops where the slope is more stable (McNeal, 1987). The presence of associates like *Cercocarpus intricatus* and *Dudleya calcicola* implies the presence of carbonate rock in the area.

In Horse Canyon, the plants occur in a north-south line on a rocky, east-facing slope, where they occur about the base of scattered large rocks. The substrate here is primarily volcanic rock of pyroclastic origin, mainly tuffs and agglomerates (Hare, 1996).

Allium shevockii does not occur in areas where the dominant substrate is granitic, contrary to Shevock's note on the Field Survey form dated June 15, 1985, (Shevock, 1985a), the label of his specimen #11219 (Shevock 1985b), and the report by McNeal (1987) of the plant occurring on an igneous (aplite) intrusion at the type locality (J. Shevock, pers. comm., 1997).

Little is known about the requirements of this species at present. More research needs to be done to determine both the true extent of the species' range, and its habitat requirements.

Population Status:

After more than ten years of exploration, only one new occurrence of Spanish Needle Onion has been documented (i.e., the Horse Canyon population). Thus, it appears that *Allium shevockii* is a highly restricted and rare California endemic (J. Shevock, pers. comm. 1999).

Threats Analysis:

The only known threat to the Spanish Needle Peak population is maintenance on the Pacific Crest Trail. The population occurs completely within the Owens Peak Wilderness (J. Shevock, pers. comm., 1997), and the terrain is so rugged that there is no danger to the vast majority of the plants.

About half of the Horse Canyon population occurs on an island of public land, recently made a BLM Area of Critical Environmental Concern (ACEC), surrounded by private land. There is a small chance that an adjacent portion may be used for wind energy farms at some time in the future, but this has already been attempted and rejected, so is not likely to come up again soon (S. Hare, pers. comm., 1997).

Another possible, but at present unlikely, threat is from development on a nearby parcel that has been proposed and approved for subdivision. No development has occurred, however, and it seems unlikely that it will in the near future (S. Hare, pers. comm., 1997). If the development should occur, the presence of greater numbers of people in the area could lead to destruction or modification of habitat by greater numbers of off-road vehicles, hikers and equestrian groups, which constitute the majority of current uses in the area.

There is a possible threat of over-collection by bulb collectors, because the flowers of Spanish Needle onion are showy. However, the remoteness and ruggedness of the terrain make this potential problem very unlikely at the Spanish Needle Peak locality. It is somewhat more likely to occur at the Horse Canyon locality because of accessibility.

There is not enough information about Spanish Needle onion to determine whether existing regulatory mechanisms alone are adequate to protect the plant. However, the ruggedness and remoteness of the terrain in the Spanish Needle Peak area virtually assures protection for that population, regardless of any regulatory mechanisms.

As much as half of the Horse Canyon population occurs on a BLM Area of Critical Environmental Concern (ACEC). Here, on this island of public land surrounded by private land, the question of the adequacy of existing regulatory mechanisms will be tested. Presumably, the existing mechanisms for protection are adequate. At the least, they are (or should be) closely monitored for effectiveness, and could be modified quickly if it becomes necessary to provide more protection for the species.

Existing legal and regulatory mechanisms for protection of the portion of the population that occurs on private land are weak and therefore inadequate. The only requirement is that the species be "fully considered" during the CEQA process prior to any proposed development. There is no requirement for the project proponent to take any action to protect the species, and little anyone else can do if the proponent and/or the planning agency lack the inclination to protect the rare plants. As a result, the plants on private land are at a high risk of extirpation.

Some plants may be destroyed by natural earth movements on the steep slopes on which the species is found. A major rockslide could destroy a large number of the plants in an area, and a large earthquake could trigger devastating rockslides. The species has survived a number of large seismic events in the past, (e.g., the earthquake of 1857), so it is unlikely that such an event would extirpate the entire population. However, it could cause reductions in the numbers of individuals so severe that the species might then succumb to stochastic events, to which it is vulnerable due to its restricted distribution and limited number of populations. Any type of blasting or large-scale earth movement in the area by man could have the same effect. Although this type of activity is very unlikely to occur at Spanish Needle Peak, because of the terrain and the wilderness status of the area, it is much more likely to occur at the Horse Canyon site because of its greater accessibility.

Biological Standards:

At the present, very little is known about requirements for the species' survival. Even the number of existing populations is uncertain. As noted above, in over ten years of explorations, only two localities supporting populations of this species have been discovered. Continuing systematic surveys for other populations will help to answer questions, and will contribute additional information about the species biological requirements.

A small percentage of the population at Spanish Needle Peak may be impacted by periodic maintenance work on the Pacific Crest Trail, which cuts through the lower portion of the population. This threat can be minimized by performing work carefully.

The threats of habitat destruction, trampling, over-collecting, etc, stemming from possible development on the parcel near the Horse Canyon site, could be minimized by fencing, or by other management techniques.

The ACEC on which a portion of the Horse Canyon population occurs, was created for paleontological and archeological resources. The BLM could add botanical resources to the reasons for the ACEC existence; this would increase awareness of the potential vulnerability of the plants, and perhaps lessen bureaucratic delays should more protection for them suddenly become necessary (e.g., if the approved development in the area should suddenly begin, or there was an increase in off-road traffic through the area).

Literature Cited:

California Department of Fish and Game (CDFG) 1986. Natural Heritage Division, California Natural Diversity Database, Sacramento, California. Element occurrence printout attached to Shevock et al. Field Survey Form dated 10 June 1986.

California Department of Fish and Game(CDFG) 1997. Special Plants List, August Natural Heritage Division, Sacramento, California.

Hare, S. 1996. California Native Plant Field Survey Form, for *Allium shevockii*, on file with Natural Diversity Data Base, Sacramento, California.

McNeal, D. 1987. *Allium shevockii*, (Alliaceae), a New Species From the Crest of the Southern Sierra Nevada, California. Madroño, 34(2): 150-154.

Shevock, J. 1985a. California Native Species Field Survey Form, for *Allium shevockii*, on file with Natural Diversity Data Base, Sacramento, California.

Shevock, J. 1985b. Label data for specimen of *Allium shevockii*, Shevock #11219, RSA accession #413096.

Shevock, J., L. Norris and M. Bagley 1986a. Label data for specimen of *Allium shevockii*, Shevock #11636, RSA accession #520421.

Shevock, J., L. Norris, and M Bagley 1986b. California Native Species Field Survey Form, for *Allium shevockii*, on file with Natural Diversity Data Base, Sacramento, California.

Shevock, J. and B. Ertter 1987a. Label data for specimen of *Allium shevockii*, Shevock #11793, RSA accession #520420.

Shevock, J. and B. Ertter 1987b. California Native Species Field Survey Form, for *Allium shevockii*, on file with Natural Diversity Data Base, Sacramento, California.

Shevock, J., and S. Hare 1996. Label data for specimen of *Allium shevockii*, Shevock #13254, located at CAS.

Skinner, M.W. and B.M. Pavlik (eds.). 1994. Inventory of Rare and Endangered Vascular plants of California. Special Pub. No. 1 (5th ed.). California Native Plant Society, Sacramento, California.